

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (previously presented): A method for supplying an inspired gas to a person while ~~and~~ sampling expired gases from the person, the method comprising:

 positioning an oral-nasal cannula on the person in an area between a nose and a mouth of the person, said cannula having prongs lumens for collecting expired gases individually from each of two nares of the nose and from the mouth, said prongs each having fluid inlets and adapted to be positioned within a particular one of streams of expired gases that emanate from said nares and said mouth, and lumens for detecting at the nose and mouth when said person is inhaling and exhaling, a lumen for ~~providing a supplied~~ supplying an inspired gas from a source to said oral-nasal cannula, wherein said fluid inlets include nare fluid inlets adapted to be positioned within said streams of expired gases that emanate from the nares; said nare fluid inlets being adapted to channel expired gases from the nares to a sensor for detecting when said person is inhaling and exhaling, and wherein said oral-nasal cannula passes said supplied gas through fluid outlets that direct said supplied gas toward said nares and said mouth for inhalation, said fluid outlets being located away from said fluid inlets to minimize mixing of collected expired gases and supplied gas; for inspiration by the person, and a diffuser grid for diffusing said supplied gas in an open atmosphere proximate to the nose or mouth;

collecting expired gases using said fluid inlets;

 determining whether the person is in an ~~the~~ exhalation or an inhalation phase of a respiratory cycle using said sensor; ~~a detector connected to at least one of said detecting lumens;~~

 delivering an increased flow of inspired gas to the person during the determined inhalation phase of the respiratory cycle; and

~~collecting expired gases using at least one of said collecting lumens; and~~

 analyzing said expired gases using an analyzer; said analyzer receiving expired gases

collected by ~~connected to~~ at least one of said fluid inlets. ~~collecting lumens~~.

Claim 2 (previously presented): The method of claim 1, wherein the supplied gas includes pure gas.

Claim 3 (original): The method of claim 2, wherein the pure gas includes oxygen.

Claim 4 (original): The method of claim 1, wherein the inspired gas includes a gas mixture.

Claim 5 (original): The method of claim 4, wherein the gas mixture includes a mixture of oxygen and air.

Claim 6-9 (cancelled).

Claim 10 (currently amended): The method of claim 1, further comprising using said sensor detector ~~connected to at least one of said detecting lumens~~ to determine a primary respiratory site, and wherein said analyzer is adapted to analyze expired gases collected from said primary respiratory site.

Claim 11 (currently amended): The method of claim 10, wherein said cannula comprises at least three prongs ~~collecting lumens~~ with one prong ~~collecting lumen~~ for each of two nares of the nose and one prong ~~collecting lumen~~ for the mouth, and wherein said determination of said primary respiratory site includes identifying a less obstructed one of said nares such that said analyzer is adapted to analyze expired gases collected from said less obstructed nare by an appropriate one of said prongs.

Claim 12 (currently amended): The method of claim 11, wherein ~~whereby~~ the gas stream at the mouth is continuously sampled, in addition to sampling at said less obstructed one of said nares.

Claim 13 (previously presented): The method of claim 11, wherein said analyzing of said expired gases comprises monitoring the ventilation of the person at least in accordance with the determination of the person's primary respiratory site.

Claim 14 (currently amended): The method of claim 13, wherein ~~whereby~~ an expired gas stream at the mouth is continuously collected and analyzed.

Claim 15 (cancelled).

Claim 16 (currently amended): The method of claim 1, wherein said determining of whether the person in the exhalation or inhalation phase comprises analyzing pressure in the person's breath gas streams collected in ~~with~~ said fluid inlets ~~detecting lumens and~~ with said sensor. ~~detector~~.

Claim 17 (previously presented): The method of claim 16, wherein said detector is a pressure transducer.

Claim 18 (previously presented): The method of claim 16, further comprising monitoring the respiratory rate in accord with the pressure analysis.

Claim 19 (previously presented): The method of claim 16, further comprising monitoring the inspiratory/expiratory time ratio in accord with the pressure analysis.

Claim 20 (previously presented): The method of claim 16, wherein the pressure in the person's breath gas stream is determined by sampling pressure at at least one respiratory site.

Claim 21 (previously presented): The method of claim 1, wherein the determining of whether the person is in the exhalation or inhalation phase comprises analyzing the humidity in the person's breath gas stream with said detecting lumens and said detector.

Claim 22 (previously presented): The method of claim 21, further comprising monitoring a respiratory rate in accord with the humidity analysis.

Claim 23 (previously presented): The method of claim 21, further comprising monitoring an inspiratory/expiratory time ratio in accord with the humidity analysis.

Claim 24 (previously presented): The method of claim 1, wherein the determining of whether the person is in the exhalation or inhalation phase comprises analyzing the temperature in the person's breath gas stream with said detecting lumens and said detector.

Claim 25 (previously presented): The method of claim 24, further comprising monitoring a respiratory rate in accord with the temperature analysis.

Claim 26 (previously presented): The method of claim 24, further comprising monitoring an inspiratory/expiratory time ratio in accord with the temperature analysis.

Claim 27 (currently amended): The method of claim 10, wherein determining said primary respiratory site is accomplished by sampling pressure at the respiratory sites and comparing said pressures with said analyzer to identify a respiratory site demonstrating a larger pressure swing.

Claim 28 (previously presented): The method of claim 1, wherein analyzing said expired gases includes sampling the level of CO₂ in the person's expired breath gas stream.

Claim 29 (previously presented): The method of claim 13, wherein the monitoring of the ventilation is accomplished by measuring the CO₂ levels in the person's expired breath gas stream.

Claim 30 (original): The method of claim 29, wherein the monitoring of the ventilation is

accomplished by measuring the end-tidal CO₂ value.

Claim 31 (currently amended): The method of claim 29, wherein the monitoring of the ventilation is accomplished by determining the area under the expired CO₂ time plot. ~~[[pilot.]]~~

Claim 32 (currently amended): The method of claim 1, further ~~[[also]]~~ comprising ~~the step of~~ delivering a decreased flow of inspired gas to the person ~~patient~~ during said exhalation phase, wherein said decreased flow is sufficiently low to avoid interfering with collecting of said expired gases.

Claim 33 (currently amended): The method of claim 1, ~~[[11,]]~~ wherein analyzing said expired gases comprises monitoring the level of a drug in the person's expired breath gas stream.

Claim 34 (original): The method of claim 33, wherein the drug is an intravenous anesthetic.

Claim 35 (original): The method of claim 33 wherein the drug is propofol.

Claim 36 (previously presented): The method of claim 1, wherein analyzing said expired gases comprises detecting xenon in the person's expired breath gas stream.

Claim 37 (currently amended): An apparatus that delivers inspired gas to a person and samples expired gases from the person, said apparatus comprising:

an oral-nasal cannula having an elongated body adapted to be situated on the person in an area between a nose and a mouth of the person, said cannula comprising prongs ~~samplers~~ extending into expired breath gas streams of each nare of the nose and of the mouth, and said cannula comprising a plurality of fluid outlets adapted to supply a flow of inspired gas in a direction of ~~and a diffuser grid for releasing a supplied gas in an open atmosphere proximate to~~ each nare of the nose and a direction of the ~~or mouth, wherein said prongs each have fluid inlets adapted to collect expired gases individually from said streams of expired gas;~~

an inspired gas delivery device, said gas delivery device comprising a mechanism for delivering a variable flow of said inspired ~~supplied~~ gas and a controller for managing said mechanism in response to a determined phase of the person's respiration cycle;

a sensor in fluid communication with one or more of said fluid inlets that are adapted to be positioned within said streams of expired gases emanating from the nares, said sensor generating signals to said controller indicating said person determined phase;

a supply lumen for providing a supplied gas from said delivery device to said oral-nasal cannula, and wherein said oral-nasal cannula passes said supplied gas to fluid outlets that direct said supplied gas toward said nares and said mouth for inhalation;

an analyzer adapted to detect characteristics of said expired breath gas streams, said analyzer being ~~connected to said controller;~~ in electronic communication with said sensor and in fluid communication with one or more of said fluid inlets; and

a set of lumens connecting said prongs of said cannula to said sensor ~~of said delivery device~~ and said analyzer; wherein said analyzer detects said characteristics in coordination with a the present determined phase of the person's respiration cycle, and wherein the inspired gas delivery device controller modulates delivery of inspired gas to said cannula in accordance with the determined phase of the person's respiration ~~respiratory~~ cycle so as to provide a higher flow of supplied gas to the person during an inhalation phase.

Claim 38 (currently amended): The apparatus of claim 37, wherein said prongs ~~samplers~~ comprise at least one nasal prong sampling device for each said nare nasal passage and at least one prong ~~an oral sampling device~~ for the mouth.

Claim 39 (currently amended): The apparatus of claim 37, wherein the controller directs said mechanism to deliver a higher flow of supplied gas during a portion of the inhalation phase of the person's respiratory cycle, and a lower flow of supplied gas otherwise.

Claim 40 (currently amended): The apparatus of claim 38, wherein said sensor analyzer comprises a pressure comparator and wherein at least one of the inlets in two or more of said prongs ~~nasal samplers and the oral sampler~~ are connected to said a pressure comparator such

that said sensor analyzer can determine a primary respiratory site of the person.

Claim 41 (currently amended): The apparatus of claim 37, [[40,]] wherein said analyzer further comprises a gas detecting device.

Claim 42 (previously presented): The apparatus of claim 41, wherein the gas detecting device is a capnometer.

Claim 43 (currently amended): The apparatus of claim [[41,]] 40, wherein said analyzer further comprises a gas detecting device wherein the gas detecting device comprises a nasal gas sampling device and an oral gas sampling device and wherein the controller selects at least the gas stream from the primary respiratory site for monitoring.

Claim 44 (currently amended): The apparatus of claim 41, wherein said gas detecting device comprises a nasal gas sampling device and an oral gas sampling device, and [[43,]] wherein the oral and nasal gas sampling devices are capnometers in fluid communication with appropriate ones of said fluid inlets.

Claim 45 (previously presented): The apparatus of claim 37, wherein said inspired gas delivery device comprises a flow control valve and wherein the controller runs software that indicates an error to a user if while the flow control valve is open, the controller detects pressure at a source of said supplied gas but fails to detect pressure downstream of the flow control valve.

Claim 46 (original): The apparatus of claim 37 also comprising an auditory breath sonification device that amplifies breath sounds.

Claim 47 (original): The apparatus of claim 46, wherein the auditory breath sonification device is a microphone that amplifies actual breath sounds.

Claim 48 (original): The apparatus of claim ~~[[46,]]~~ further comprising an auditory breath sonification device, wherein the auditory breath sonification device comprises a white noise generator that provides simulated breath sounds in response to said determined phase.

Claim 49 (previously presented): The apparatus of claim 48, wherein said simulated breath sounds distinguish between inhalation and exhalation breath sounds according to said determined present phase of the person's respiration cycle.

Claim 50 (previously presented): The apparatus of claim 37, wherein the gas detecting device measures CO₂ presence.

Claim 51 (previously presented): The apparatus of claim 37, wherein the gas detecting device measures xenon presence.

Claim 52 (previously presented): The apparatus of claim 37, wherein the detector is adapted to identify traces of a drug in expired breath gas of the person.

Claim 53 (original): The apparatus of claim 52, wherein the drug is an intravenous anesthetic.

Claim 54 (original): The apparatus of claim 52, wherein the drug is propofol.

Claim 55 (currently amended): The apparatus of claim 37, ~~[[38,]]~~ wherein said prongs ~~samplers~~ have distal ends with openings for expired gas to enter said fluid inlets, ~~inlets at said distal ends~~, and wherein said openings ~~gas inlets~~ extend sufficiently into expired breath airstreams of the nose and mouth and away from said fluid outlets ~~diffuser grid~~ so as to limit interference by said supplied gas upon said analyzer.

Claim 56 (currently amended): The apparatus of claim 37, wherein the controller provides a reduced ~~reduces the~~ flow of inspired gas during an exhalation phase.

Claim 57 (currently amended): A method for delivering an inspired gas to a person and monitoring gases expired by the person, said method comprising:

determining the breath phase of the person with a detector, said detector having lumens interfacing with the person via one or more ~~prongs~~ lumens inserted in ~~one or more~~ paths of one or more expired breath gas streams of the person, said paths emanating from nares of a nose and from a mouth of the patient, said prongs being mounted at their respective bases on a cannula body and including fluid inlets in communication with said detector lumens, and said determined breath phase including an inhalation phase and an exhalation phase;

delivering a relatively higher flow of an inspired gas to the person during the inhalation phase, said inspired gas being introduced ~~to an open atmosphere~~ proximate to the nose ~~or mouth~~ of the person ~~using a inspired gas supply lumen and~~ via a plurality of fluid outlet holes in said cannula body, said holes being located immediately about a base of and partially surrounding each said nare prong; and diffuser grid; and

monitoring gases in the one or more expired breath gas streams with an analyzer to assess the health of the person, said analyzer being in communication with said fluid inlets, and said analyzer thereby having lumens interfacing with the person via said one or more paths;

wherein said monitoring provides feedback for controlling flow of said inspired gas.

Claim 58 (previously presented): The method of claim 57 further comprising determining at least one of the breath rate and inspiratory/expiratory time ratio.

Claim 59 (previously presented): The method of claim 58, wherein determining at least one of the breath phase, breath rate and inspiratory/expiratory time ratio is accomplished by analyzing the pressure waveform produced within at least one of said paths during said phases.

Claim 60 (previously presented): The method of claim 58, wherein determining at least

one of the breath phase, breath rate and inspiratory/expiratory time ratio is accomplished by monitoring the humidity at at least one respiratory site.

Claim 61 (previously presented): The method of claim 58, wherein determining at least one of the breath phase, breath rate and inspiratory/expiratory time ratio is accomplished by monitoring the temperature at at least one respiratory site.

Claim 62 (currently amended): The method of claim 57 also comprising the step of delivering a relatively lower ~~reducing the~~ flow of inspired gas during the exhalation phase.

Claim 63 (currently amended): The method of claim 57, wherein the monitoring of exhaled gas is performed during a period of lower ~~low~~ gas flow in the exhalation phase.

Claim 64 (previously presented): The apparatus of claim 37 wherein said lumens and said cannula are disposable, and wherein said lumens are packaged affixed to one another along separable tear lines.

Claim 65 (original): The apparatus of claim 64, wherein the lumen that accommodates the flow of inspired gas is of larger circumference than the other lumens.

Claim 66 (currently amended): The apparatus according to claim 64, wherein said cannula is connected to an auditory device via a sound lumen, said auditory device creating a sound that is transmitted to the person such that said sound lumen functions as one of said ~~lumens~~ is a stimulus channel that carries an auditory prompt to the person.

Claims 67-79 (canceled).

Claim 80 (previously presented): The method according to claim 1, wherein said lumens and said cannula comprise a pneumatic harness, and wherein said lumens are pre-packaged in one or more clusters, said clusters being manually separable from one another and attachable

to said cannula prior to positioning on the person.

Claim 81 (previously presented): The method according to claim 80, wherein said clusters have tear lines to permit separation of the lumens from one another.

Claim 82 (previously presented): The method according to claim 80, wherein each cluster has a cross section defining an aerofoil shape.

Claim 83 (previously presented): The method according to claim 80, wherein said pneumatic harness further comprises an adapter that facilitates connecting the pneumatic harness to a medical device.

Claim 84 (currently amended): The method according to claim 1, further comprising determining which of two nares of the nose is less obstructed, wherein said determining of the less obstructed nare includes: sensing ~~sampling~~ pressure in the gas stream of each nare; comparing the pressure variations in the gas stream within each nare; comparing the extent of variation of said pressures as between each nare; and selecting the nare with the larger pressure variation as the nare that is less obstructed.

Claim 85 (previously presented): The method of claim 84, wherein the nare that is less obstructed is selected to receive inspired gas.

Claim 86 (previously presented): The method of claim 84, wherein the nare that is less obstructed is selected for said collecting of said expired gases.

Claim 87 (currently amended): The apparatus ~~method~~ according to claim 85, [[39,]] wherein said increased flow of supplied gas is delivered during a portion of the inhalation phase of the person's respiratory cycle, and wherein said portion of the inhalation phase ends in advance of the exhalation ~~inhalation~~ phase.

Claim 88 (previously presented): The apparatus according to claim 37, wherein said lumens and said cannula comprise a pneumatic harness, and wherein said lumens are pre-packaged in one or more clusters, said clusters being manually separable from one another and attachable to said cannula prior to positioning on the person.

Claim 89 (previously presented): The apparatus according to claim 88, wherein at least one of the lumens is larger than the other lumens.

Claim 90 (previously presented): The apparatus according to claim 88, wherein said clusters have tear lines to permit separation of the lumens from one another.

Claim 91 (currently amended): The apparatus according to claim 88, wherein at least one of said clusters ~~each cluster~~ has a cross section defining an aerofoil shape to accommodate multiple fluid communication channels.

Claim 92 (previously presented): The apparatus according to claim 39, wherein said portion of the inhalation phase ends in advance of the inhalation phase.

Claim 93 (new): The method of claim 1, wherein said prongs include a distal end and a proximate end, said distal end having openings to said fluid inlets and said proximate ends being attached to a body of said cannula, and wherein said fluid outlets comprise a plurality of holes located immediately about and partially surrounding the proximate end of said nare prongs.

Claim 94 (new): The method of claim 93, wherein said fluid outlets comprise a plurality of holes arranged in an arc around the base of each nare prong to diffuse supplied gas in the direction of each nare.

Claim 95 (new): The method of claim 94, wherein said plurality of holes are arranged to deliver supplied gas toward said nares in a diffuse manner.

Claim 96 (new): The method of claim 94, wherein said plurality of holes are arranged substantially concentrically to said prongs.

Claim 97 (new): The method of claim 1, wherein said fluid outlets are located downstream from said fluid inlets relative to corresponding ones of said expired gases streams.

Claim 98 (new): The method of claim 1, wherein said sensor is in communication with said nare fluid inlets via sensor fluid channels running through said cannula, each said sensor fluid channel terminating within a fluid inlet of one of said nare prongs.

Claim 99 (new): The method of claim 98, wherein said analyzer is in communication with said nare fluid inlets via analyzer fluid channels running through said cannula, at least one said analyzer fluid channel terminating within a fluid inlet of each said nare prong and one said analyzer channel terminating within a fluid inlet of said mouth prong.

Claim 100 (new): The method of claim 99, wherein said analyzer fluid channels connect said nare fluid inlets to a first analyzer and said mouth fluid inlets to a second analyzer.

Claim 101 (new): The method of claim 98, wherein said sensor detects pressure changes caused by expired gases exiting the nose.

Claim 102 (new): The method of claim 1, wherein said delivery of said flow of inspired gas is performed by an automated gas delivery device, said delivery device comprising a flow control valve and a controller wherein the controller runs software that indicates an error to a user if while the flow control valve is open, the controller detects pressure at said source of said supplied gas but fails to detect pressure downstream of the flow control valve.

Claim 103 (new): The method of claim 1, wherein said determining step comprises

monitoring changes in a sum of the pressures detected at both the nares.

Claim 104 (new): The method of claim 103, wherein said delivering step comprises initiating said increased flow of inspired gas when said sum crosses an upper negative pressure threshold in a decreasing direction, and ceasing said increased flow when said sum crosses a lower negative pressure threshold in an increasing direction.

Claim 105 (new): The apparatus of claim 37, wherein said prongs include a distal end and a proximate end, said distal end having openings to said fluid inlets and said proximate ends being attached to said body, and wherein said fluid outlets comprise a plurality of holes located immediately about and partially surrounding the proximate end of each said nare prong.

Claim 106 (new): The apparatus of claim 105, wherein said fluid outlets comprise a plurality of holes arranged in an arc around a base of each nare prong to diffuse supplied gas in the direction of each corresponding nare.

Claim 107 (new): The apparatus of claim 106, wherein said plurality of holes are arranged to deliver supplied gas toward said nares in a diffuse manner.

Claim 108 (new): The apparatus of claim 106, wherein said plurality of holes are arranged in a pattern substantially concentrically to each nare prong.

Claim 109 (new): The apparatus of claim 37, wherein said fluid outlets are located downstream from said fluid inlets relative to corresponding ones of said expired gases streams.

Claim 110 (new): The apparatus of claim 37, wherein said sensor is in communication with said nare fluid inlets via sensor fluid channels running through said cannula, each said sensor fluid channel terminating within a fluid inlet of one of said nare prongs.

Claim 111 (new): The apparatus of claim 110, wherein said analyzer is in communication with said nare fluid inlets via analyzer fluid channels running through said cannula, at least one said analyzer fluid channel terminating within a fluid inlet of each said nare prong and one said analyzer channel terminating within a fluid inlet of said mouth prong.

Claim 112 (new): The apparatus of claim 111, wherein said analyzer fluid channels connect said nare fluid inlets to a first analyzer and said mouth fluid inlets to a second analyzer.

Claim 113 (new): The apparatus of claim 110, wherein said sensor detects pressure changes caused by expired gases exiting the nose.

Claim 114 (new): The apparatus of claim 37, wherein said sensor monitors changes in a sum of the pressures detected at both the nares.

Claim 115 (new): The apparatus of claim 114, wherein said signal to said controller causes said controller to initiate said higher increased flow of inspired gas when said sum crosses an upper negative pressure threshold in a decreasing direction, and ceasing said higher flow when said sum crosses a lower negative pressure threshold in an increasing direction.

Claim 116 (new): The method of claim 57, wherein said prongs include a distal end and a proximate end, said distal end having openings to said fluid inlets and said proximate ends being attached to a body of said cannula, and wherein said fluid outlet holes are located immediately about and partially surrounding the proximate end of said nare prongs.

Claim 117 (new): The method of claim 116, wherein said fluid outlet holes are arranged in an arc around the base of each nare prong to diffuse supplied gas in the direction of each nare.

Claim 118 (new): The method of claim 117, wherein said plurality of holes are arranged to deliver supplied gas toward said nares in a diffuse manner.

Claim 119 (new): The method of claim 117, wherein said plurality of holes are arranged in a substantially concentric pattern around said nare prongs.

Claim 120 (new): The method of claim 57, wherein said fluid outlet holes are located downstream from said fluid inlets relative to corresponding ones of said expired streams.

Claim 121 (new): The method of claim 57, wherein said sensor is in communication with said nare fluid inlets via sensor fluid channels running through said cannula, each said sensor fluid channel terminating within a fluid inlet of one of said nare prongs.

Claim 122 (new): The method of claim 121, wherein said analyzer is in communication with said nare fluid inlets via analyzer fluid channels running through said cannula, at least one said analyzer fluid channel terminating within a fluid inlet of each said nare prong and one said analyzer fluid channel terminating within a fluid inlet of said mouth prong.

Claim 123 (new): The method of claim 122, wherein said analyzer fluid channels connect said nare fluid inlets to a first analyzer and said mouth fluid inlets to a second analyzer, and said monitoring step utilizes said first and said second analyzer in cooperation.

Claim 124 (new): The method of claim 121, wherein said sensor detects pressure changes caused by expired gases exiting the nose.

Claim 125 (new): The method of claim 57, wherein said delivery of said flow of inspired gas is performed by an automated gas delivery device, said delivery device comprising a flow control valve and a controller wherein the controller runs software that indicates an error to a user if while the flow control valve is open, the controller detects pressure at said source of said supplied gas but fails to detect pressure downstream of the flow control valve.

Claim 126 (new): The method of claim 57, wherein said determining step comprises monitoring changes in a sum of the pressures detected at both the nares.

Claim 127 (new): The method of claim 126, wherein said delivering step comprises initiating said relatively higher flow of inspired gas when said sum crosses an upper negative pressure threshold in a decreasing direction, and ceasing said relatively higher flow when said sum crosses a lower negative pressure threshold in an increasing direction.